

Melancholy baby

How early experience can alter brain chemistry, leading to adult depression

And did you get what
you wanted from this life, even so?

I did.

And what did you want?

To call myself beloved, to feel myself
Beloved on the earth.

Raymond Carver, 'Late Fragment'.

One of the most familiar mental health issues of all is that of depression. From Churchill's 'black dog' to William Styron's 'darkness', we think we know what it means even if we have not experienced the full-blown symptoms of a major depression. A typical depression scenario was described to me by my client, Carys. She found the pain most intense in the early morning. When she woke up, she would become aware of a sick feeling in her stomach. Her muscles began to tense. She did not want to get up and face another day. What was the point? Nothing felt good, no one cared. There was a sharp feeling in her body, something like pain, without a specific location. A hollow feeling too, like hunger, yet she had no appetite for breakfast or anything else. She just wanted to curl up in bed and make the world go away, especially the images of failure and humiliation that endlessly circled in her head. The face of her employer when she had to tell him she'd made a dreadful mistake; her ex-partner's face and his words: 'It's not working, Carys, you are way too demanding.' She felt nothing would ever come right for her; she was a useless, bad person whom no one wanted in their life.

A striking aspect of depression is how physical it feels. This is perhaps why it is popular to describe depression as a biochemical imbalance, implying that it is a malfunction of the brain which has somehow appeared from nowhere, or possibly a result of genetic tendencies. Professor Peter Fonagy once asked 20 consecutive parents referred to his clinic what they thought had caused their child's problems. He was not surprised to learn that they all put brain chemistry at the top of the list, closely followed by 'bad genes' (Fonagy 2003). Scientific work has confirmed that depression does indeed involve biochemical changes in the brain's neurotransmitters. Depressed people do usually have some combination of low serotonin and low norepinephrine. Yet researchers have tried giving subjects doses of the neurochemicals involved in depression, and have found that on their own they do not make people depressed. Even if you create a serotonin deficiency by manipulating someone's diet, a normally balanced person will not experience this as a feeling of depression (Duman *et al.* 1997). Clearly, it is not the presence or absence of biochemicals alone which creates depression. In fact, it is more probable that these biochemicals are depleted as a side effect of an overactive stress response.

If Carys turns to the medical profession for help, she will almost certainly be offered drugs to correct these biochemical imbalances in her brain. Antidepressants such as Prozac are now household names, and are often the first resort of those suffering from depression. In some cases, they are helpful in restoring equilibrium. Yet the medical approach is less confident than it seems. Drug treatments have benefits for some patients, but as few as a third achieve a full remission of their symptoms, according to several recent studies quoted by David Gutman (Gutman, www.medscape.com). Another third have some improvement but continued symptoms, and the final third no improvement. Drug companies hope to improve future treatment by identifying each individual's catecholamine imbalance more precisely with neuro-imaging. They have also begun to target CRF, the stress hormone that triggers the production of cortisol, as the real villain of the biochemical disturbance. This may produce more effective treatments in the future.

Carys may also find some fatalistic satisfaction in learning that her depression may have a genetic component. Some twin studies have shown that identical twins are much more likely to have the same incidence of depression than non-identical twins (Andreasen 2001: 240), but there is little evidence of what exactly is being transmitted genetically. According to Willner, it may be as unspecific as a tendency to introversion that may culminate in depression in some circumstances (Willner 1985). In any case, whatever the genetic predisposition may consist of, it still has to be triggered by environmental factors to become manifest – the relevant genes are not inevitably or automatically expressed. This makes it all the more important to unravel the mystery of what these environmental factors might be.

Faced with a mounting epidemic of depression, researchers have attempted to identify its triggers. There are many angles: it is associated with a lack of B vitamins, a lack of Omega 3 fatty acids, because of losing a parent at an early age, or caused by stressful life events such as bereavement or moving house. Clearly, it is both a biological condition and a psychological one. Whilst Carys may well have low levels of certain brain chemicals that affect mood, along with inactive parts of her prefrontal cortex, her condition is also triggered by the images and thoughts in her mind. In particular, experiences of feeling rejected or abandoned by other people are the most common triggers for depression.

I believe that the core of depression is a fragile sense of self. It is a deep well of inner hopelessness, which brims over periodically when a vulnerable person's stocks of well-being are depleted – whether by a lack of essential nutrients, a lost relationship, a humiliation, an illness, or a burglary. It is an interesting fact that very few people who experience life events such as a bereavement or loss do actually become seriously depressed. They experience sadness and pain, but they do not become overwhelmed by it. However, such events often do trigger depression in someone who is already prone to it (Brown and Harris 1978; Carr *et al.* 2000).

Where does this fragile sense of self come from? Like many other depressed clients, Carys tells me the stories of her childhood that she remembers. Certain events and

phrases stick in her mind. 'You are so selfish.' 'Just get on with it.' I have heard the same phrases from client after client: 'It won't work, you know.' 'I might have known you'd make a mess of it.' 'You are pathetic.' 'No wonder she doesn't like you.' 'Your brother is so good with people – but you have no personality.' 'You'll never be able to do that, you'd better let me do it.' 'You don't have much common sense.' They may seem relatively innocuous, but they conjure up a certain kind of negative atmosphere in which the depressed person has grown up. Cumulatively, they convey the message that individuals like Carys are inadequate and ineffective.

This leaves her in a state of longing for parental approval, for 'social reinforcement', love and belonging, whilst having little confidence in being able to obtain these things. But surely she should be able to get on with her life now that she is an adult? Carys is actually in her fifties. She has been married, had children and divorced. She has had affairs. She works part-time as a receptionist – a job below her capabilities. But she still can't create satisfying relationships with other people that could sustain her emotionally. Underneath the surface appearance of living a normal adult life, she has unconsciously accepted the negative messages of her childhood that she is substandard in some way. In her early life, she developed an internal working model of herself as not good enough, or even 'bad', as she failed to live up to her parents' expectations or capture their attention.

This unconscious working model is very easily triggered by fresh cues from her environment. When her relationships go wrong – whether it is a neighbour criticising her for having her radio on too loud, or a lover ending the relationship – she falls apart. She feels suicidal. In her mind, it is all hopeless. She's a bad person and no one will ever really love her. Like Tolstoy's Anna Karenina, she is so insecure that misunderstandings are amplified and experienced as abandonment. In Tolstoy's novel, Count Vronsky just has to disagree with Anna and she thinks he hates her. She magnifies every slight into a cataclysmic abandonment, imagining the worst: 'He loves another woman, that is clearer still,'

she said to herself as she entered her own room. 'I want love, and it is lacking. So everything is finished!' she repeated her own words, 'and it must be finished'. (Tolstoy 1877/1995). Soon afterwards, Anna does indeed kill herself, as do around 15 per cent of seriously depressed people.

Why is depression on the increase?

Depression has been studied extensively because it is such a pervasive disorder and affects so many people. The latest estimates from the USA are that one in ten people, 10 per cent of the adult population, suffer from some form of depression. About 17 per cent of the population will suffer serious depression at some point in their life. Not surprisingly, this is a potential goldmine for pharmacological companies, who devote huge resources to developing new drug treatments for this profitable sector of their market, which looks set to expand. Nancy Andreasen, the head of the American Psychiatric Association, thinks that the rate of depression has increased dramatically since the 1950s, and is on a steady upward curve (Andreasen 2001). It may be coincidental that antidepressants were discovered in the 1950s, but it raises the question of whether the increase in depression is a greater willingness to be described as 'depressed' once there was a 'cure' available.

Most of the literature on depression is confined to its symptoms. The focus is on the adult's brain chemistry and the adult's cognitions, which are the target of treatments. There is remarkably little recognition that the adult's brain is itself formed by experiences starting in the womb, or that these may have contributed to a predisposition to depression. Yet there is abundant evidence that an overreactive stress response underlies chronic depression, as well as other brain systems that are being orchestrated and fine-tuned in infancy. There is also evidence that a lack of emotional confidence and destructive internal working models can be set up very early in life. I will now turn to an exploration of these missing dimensions of the understanding of depression.

Madonna and child

In that time of early life celebrated by paintings and icons of the Madonna and child, mother and baby may, if all goes well, find themselves in a kind of cocoon of peace and love. Breastfeeding itself inactivates the mother's own stress response; her amygdala expresses less CRF, presumably removing anxious, fearful feelings; whilst the prolactin generated by breastfeeding provides a feeling of tranquillity. The breastfeeding state of mind facilitates her ability to calm her baby and to manage his stress. Once established (and this is not always easy to achieve), breastfeeding can be a powerful source of sustenance for the mother as well as the baby.

She is then potentially more able to inhibit her baby's stress response and to ensure that his cortisol levels remain low. This is achieved through her presence, her feeding and her touch. The baby is protected from stress and discomfort and his brain responds by growing more cortisol neurons. A brain well stocked with cortisol receptors through this early experience will be better able to mop up this stress hormone when it is released in future. This furnishes the baby's brain with the capacity to stop producing cortisol when it has helped deal with a source of stress. The stress response will quickly be turned off when it is no longer needed.

But if the baby doesn't have this experience of being cocooned in a protective mother's arms (whether provided with bottle feeding or the breast), or if she is absent for too long, then his stress response can kick in and become active prematurely. The baby may become flooded with cortisol and the cortisol receptors will close down. This means that in the future he will have fewer cortisol receptors. The cortisol secreted at times of stress will not find enough receptor homes to go to, particularly in the hippocampus and hypothalamus, and will continue to wash around his brain, producing the high cortisol levels and the feeling that stress cannot be stopped. A reactive stress response will have been set up. There have been numerous studies linking depression with such a hyper-reactive stress response.

Neither Carys nor Anna Karenina were necessarily born to be drama queens, easily swept into misery by their self-centred view of the world. They may equally have had damaged stress response systems and depleted neurotransmitters because of their early experience as babies. Brought up by stressed or depressed mothers, or by child-minders or nannies, they may have lacked the quality of attention that is necessary for small babies to thrive – the ‘primary maternal preoccupation’ described by the psychoanalyst Donald Winnicott (1992).

Human connections equal brain connections

Lacking these early experiences of blissful protected infancy doesn’t just affect your stress response and your ability to switch off cortisol. A lack of positive rewarding interaction with the mother can have other negative effects on the brain’s biochemicals. Specifically, neglect or being deprived of the mother’s presence is linked to low levels of norepinephrine, which make it hard for an individual to concentrate or sustain effort. This biochemical is usually low in depressed adults and it hampers the individual’s ability to adapt, tending to keep a person doing the same old thing over and over again even if it is bad for him or her. An unhappy early relationship can also constrict the capacity for pleasure and reward in later life, due to fewer dopamine receptors and opiate receptors in the baby’s brain, especially in the prefrontal cortex where they are usually very densely present. Early social deprivation or stress can lead to permanent reduction in dopaminergic neurons (Martin 1997; Lagercrantz and Herlenius 2001), affecting the capacity for positive emotionality (Depue *et al.* 1994).

On the other hand, a child experiencing lots of rewarding contact, or one who is more successful in the genetic lottery, may end up with more dopamine synapses (Collins and Depue 1992). This affects the way that life is approached. With plenty of dopamine activity, the child approaches experience in a positive way. Dopamine flowing through the orbitofrontal cortex helps it to do its job of evaluating events and adapting to them quickly. It also helps the child

to delay gratification and stop and think about choices of action. The child with fewer dopamine cells will be less aware of the positive rewards on offer, less able to adapt and think, may be physically slower, and may be more prone to depression and giving up.

Neurotransmitter connections are the way that our brains encode our sensory experiences within our neuronal pathways. Different experiences are reflected in ‘alterations of neurochemical transmission at cortical synapses’ (Collins and Depue 1992). A reduction in these neurotransmitters can also affect the connections between different levels of the brain. In particular, it may mean that the important regulatory connections between the prefrontal cortex and the subcortex are weaker.

Breastfeeding itself, which nowadays only a small minority of babies experience for longer than a few weeks, may play an important role in furnishing the baby’s brain with the ingredients for a pleasurable life through the fatty acids provided in breast milk. Breastfed infants have higher levels of polyunsaturated fatty acids (PUFAs) than bottlefed babies (Larque *et al.* 2002). These essential fatty acids are involved in producing neurotransmitters such as dopamine and serotonin, especially in the prefrontal cortex (Wainwright 2002). Animal studies suggest that if there is a deficiency of PUFAs in early life, this may have permanent effects. The brain does not fully recover if it does not get the nutrients it needs during the period before weaning, even if they are replaced later (Kodas *et al.* 2002). If this turns out to be true of human babies too, it may contribute to the way that the neurotransmitter balance is set in early life. Certainly, without sufficient PUFAs, the synaptic density of the prefrontal cortex decreases. Interestingly, links between low PUFAs and human depression have also been recently established (Maes *et al.* 1999; Bruinsma and Taren 2000), although it has been found that PUFA supplements or a diet high in oily fish do help recovery from depression (Stoll *et al.* 1999; Peet and Horrobin 2002).

The power game

Babies who can't get the attention they need and who do not feel adequately protected from distress are forced to become aware of their own helplessness and powerlessness. But such awareness is premature because a young baby has virtually no capacity to regulate his own distress or act in his own interests. There is little he or she can do if no one responds to his protests and cries, except to try not to feel and to 'play dead'. This may be the safest course of action if his needs are an irritation to his caregivers.

Such passive behaviour is very like the behaviour of the rats that Martin Seligman studied in the 1980s. When they were put in unpleasant situations from which there was no escape, which they were powerless to affect, they gave up. They withdrew into a hopeless state. But what Seligman found most telling was that they carried on behaving in a powerless way even when conditions changed. When the stressful experience was over, they didn't even try to escape. He called this 'learned helplessness' (Seligman and Beagley 1975).

In this state of powerlessness and stress, high levels of cortisol are produced. As Sapolsky's work with baboons showed, it is stressful being at the bottom of the social pecking order. But it is equally stressful to be a baby who depends on parents who don't notice or meet your needs. In both cases, survival is at stake. As social creatures who depend on others, survival is not possible alone. It is frightening to be ignored, humiliated, threatened or trapped. It is not safe. Conversely, people (or animals) with social power feel safe, feel free to express themselves and expect to get their needs met. But without such power, the only safe course of action is to withdraw and submit to others.

Andrew Solomon, author of the masterful book on depression, *The Noonday Demon*, offers the intriguing thought that there is an evolutionary reason for withdrawal and depression (Solomon 2001). When subjected to attack by other more powerful members of the social group against whom he cannot win, the loser withdraws. He doesn't challenge his low social rank any more, in order to avoid a worse outcome – that of death. In the same way, in the family

group, perhaps a child who is devalued and criticised will also accept his low status in order to survive. Our conflicts are played out at a more psychological level than those of our ancestors, but they are essentially the same defensive manoeuvres.

Cortisol is highest when the individual feels a loss of power or control over events, particularly if this cannot be predicted. The act of mentally preparing for an unpleasant experience does provide some protection against its stressful effects and results in the production of less cortisol. Presumably, the mental preparation provides some degree of control. Brier's research found that even depressed people have a normal cortisol response to stress when they have some measure of control over a stressor, but when they faced uncontrollable stress their cortisol levels shot up (Brier *et al.* 1987). This may account for the tendency of some depressed people to stick with low-risk relationships or job situations, which are predictable and familiar. It may be preferable to accept a low view of oneself than to risk social encounters which may raise one's status but may end in humiliation. It is particularly painful to reach out for affirmation and acceptance from other people and to fail to receive it.

Left and right brains

High cortisol levels are also associated with a highly active right brain and an underactive left brain. This is not the normal pattern. We know from the work of Tomarken and Davidson that most people have more active left than right brain hemispheres. They found that this was a stable characteristic – a 'trait' not a 'state' (Tomarken *et al.* 1992; Kalin *et al.* 1998b). An active left brain is linked to positive feelings, cheerfulness and a willingness to approach others with a kind of extraverted outlook. People like this who are shown amusing film clips tend to find them intensely positive. However, not everyone's brains are the same. There are also a lot of people who have a permanently more active right frontal hemisphere and they often do not see the joke. Instead, they are likely to have stronger responses to film clips which are negative and full of disaster (Tomarken *et al.*

1990). Depressed people are like this, and not just when they are currently depressed but all the time.

Depressed people seem to have a sluggish left frontal brain, incapable of managing when a storm of negative feelings erupts in the right frontal brain. In particular, during a depressive episode, they have less cerebral blood flow in the left dorsolateral and the left angular gyrus – a state which has been associated with apathy and ‘poverty of speech’ (Lichter and Cummings 2001). They also have some cognitive impairment correlated with decreased blood flow in part of the left medial prefrontal cortex (Bench *et al.* 1993; Drevets *et al.* 1997). Some studies in rats have shown that stress initially activates the left prefrontal cortex, and only activates the right prefrontal cortex once the stress becomes prolonged or uncontrollable. The left prefrontal cortex seems to be a sort of buffer that stops little stresses becoming big ones – a buffer that depressed people often lack (Sullivan and Gratton 2002).

How do some brains go one way and some another? It isn’t certain whether some babies are in fact born with this tendency. Certainly there are babies with a hyperactive right frontal brain and a less active left frontal brain. But no study has established whether this is the case from birth or the result of experience. The fact that the left brain/right brain balance is a permanent, stable state suggests that something structural has taken place. One explanation would be that the architecture of the brain has been affected in early development. This is most likely to have happened in infancy when the brain is developing fastest, and indeed this is what research on the interactions between depressed mothers and their babies does suggest.

We know that babies of depressed mothers show this hemispheric tilt. They don’t have the normal left hemisphere predominance that other babies have, even at times when they look quite happy playing. These babies with less left frontal activity have been described as less affectionate and less likely to approach their mother whilst playing. It may be that because the mother’s own left frontal brain is less active, she cannot stimulate her baby’s left frontal brain. She cannot pass on left brain regulatory strategies either.

When they grow up, these children of depressed parents have about a six times greater risk of succumbing to depression themselves (Figure 5.1). But even as babies, there is



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from depression...

because her
mother is.

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Figure 5.1 She's suffering from depression because her mother is.

reason to believe that they are already depressed. They are often withdrawn and they avoid making eye contact with people in general. This may be because they don't expect attention and positive responses from their depressed mothers. One research study described how they are the toddlers who grab the clipboard away from their mother as she fills in the questionnaire, a bid for attention performed in a rather desperate way (Dawson *et al.* 2000).

There is no doubt that depressed mothers can also have a big negative impact on their babies' brains. One study (by Jeffrey Cohn and his colleagues) found that the normal state of play between a mother and baby is to fluctuate between positive and neutral interactions – about equally divided. But depressed mothers are very different. They offer very few positive interactions. About 40 per cent of the time they are unresponsive or disengaged, whilst much of the rest of the time they are angry, intrusive and rough with their babies. When the mother is being overtly or covertly angry, these babies look away a lot. They can't actually leave the room, of course, but perhaps they would like to. For a baby, the most painful experience of all seems to be not being able to get mother's attention. Babies make the most protest when their mother's attention is switched off, as if this is even more unbearable than maltreatment. But either way, babies of depressed mothers experience more negative than positive feelings (Cohn *et al.* 1990).

Most babies of normal mothers experience very few negative states. This raises doubts about the Kleinian psychoanalytic theory that babies are innately full of envy and greed (Klein 1988). It seems more likely that a predominance of negative emotions is associated with abnormal experiences of the mother–baby relationship. Clearly, Klein's account resonates with many people, perhaps those who themselves experienced such infancies (and blame their baby selves for it). In my view, it is probably more accurate to think of the hostility and envy of the depressed mother towards her baby than vice versa.

Poverty and depression

Depression seems to go hand in hand with poverty and 'social exclusion'. Certainly Brown and Harris found that those without economic resources were likely to experience more frequent triggers to depression, in the form of humiliations and frustrations. Yet like them, Karlen Lyons-Ruth found that it was not low income or multiple problems themselves which caused depression.

Lyons-Ruth analysed a sample of women living in poverty who were regarded as having difficulties in looking after their babies. Professionals who referred these mothers saw them as neglectful, apathetic or angry, but not as depressed. However, it turned out that they did have very high levels of depressive symptoms, often in a low-level, chronic form which Karlen Lyons-Ruth described as 'burnt out', their coping abilities stretched to breaking point. Other carefully matched women from the same poor communities who were coping all right with their children had far fewer depressive symptoms.

Lyons-Ruth suggests that the difficulties such women experience in parenting are not due solely to poverty or current problems alone, but have to be understood in the context of a life history of poor regulation, rooted in their own childhood experiences. What mattered most was whether or not they had a good relationship with their own mother in childhood. This was most predictive of depression and poor parenting (Lyons-Ruth 1992).

In my parent/infant practice, depressed mothers are the norm. Usually they are desperately in need of loving attention themselves. The majority describe difficult relationships with their own mothers. For example, Benita had a mother who was disabled so she felt unable to make demands on her, Sally had an unpredictable alcoholic mother, Jill's mother was a career woman, busy and unavailable. Those parents who present a more positive account of their relationship with their mothers often aren't able to substantiate it. Many of these mothers did not get the attention they needed as babies and small children and now find it hard to provide it for their own babies. They feel helpless with their

own babies, not knowing what to do, how to get the baby to stop crying, or to sleep through the night. They want the baby to grow up fast and not need so much attention.

Living with any mother who isn't emotionally available, for whatever reason, has much the same effect on the baby's brain as do more obvious deprivations such as complete isolation. Babies come into the world with a need for social interaction to help develop and organise their brains. If they don't get enough empathic, attuned attention – in other words, if they don't have a parent who is interested in them and reacting positively to them – then important parts of their brains simply will not develop as well.

This particularly affects the prefrontal cortex, the social brain. This is the part of the brain which has been strongly implicated in depression. In depressed people the prefrontal cortex is smaller, particularly on the left side. This has been found across a number of studies and has even been established with teenagers who are depressed (Steingard *et al.* 2002). Unless it can be shown in subsequent studies that a small prefrontal cortex is genetically determined, this does provide powerful evidence that depression is linked with the poor development of the social brain in its most formative period of infancy and toddlerhood. In particular, there is a reduced density of neurons in the dorsolateral part of the prefrontal cortex, the area that develops in toddlerhood and is involved in verbalising feelings. The more depressed you are, the less activity there is in the prefrontal cortex, and with less blood flow in the prefrontal cortex, fewer neurotransmitters like serotonin or norepinephrine are released. In particular, the orbitofrontal part of the prefrontal cortex is also less active, making it harder for depressed people to judge situations and control their reactions.

These effects could be the result of maternal care or lack of it. Crying babies only reach high levels of cortisol if they are overwhelmed and unable to cope with their distress – if their regulatory partner does not do an effective job in reducing stress. Unfortunately, the way that babies are managed can have lasting effects. Babies who cry a lot at 4 months are the ones who show inhibited, withdrawn

behaviour at 1 year. These are then the children who can be accurately predicted to become shy 4 year olds. At the most drastic extreme, Romanian orphans who have had virtually no mothering at all have brains with less active left orbitofrontal cortex, amygdala, hippocampus and temporal areas than comparable children of their age – precisely the areas involved in managing stress (Chugani *et al.* 2001).

The off switch

Numerous studies have shown that cortisol levels are high in most people with serious depression, but if you can get the cortisol level back to normal the symptoms of depression will abate. As Andrew Solomon has described it, a state of high cortisol is like having the heating on all day even though the room is boiling hot. The stress response just keeps going even if there is no obvious stress around. Every little thing becomes a source of stress. The problem is that there is something wrong with the 'off' switch.

People who are vulnerable to these biochemical imbalances find that when unpleasant things happen to them, they cannot right themselves and tip the balance back to normal, as other people can. Their recovery mechanisms are damaged. Once again, this operates at both a biological and psychological level. At the biological level, the negative feedback loop within the brain is malfunctioning. When the level of cortisol is high for too long, it starts to affect the functioning of the hippocampus. This may be a particular problem in the developing brain. Recent research on monkeys suggests that high cortisol may be particularly toxic to the developing hippocampus, less so to the adult hippocampus. When researchers gave grown monkeys cortisol over a prolonged period, it had little effect on their hippocampi.

A malfunctioning hippocampus then fails to inform the hypothalamus that it is time to switch off the production of CRF. The hypothalamus, which is connected to many areas of the brain including the fear-generating amygdala, fails to use its 'off' switch. This means that the stress response goes on and on.

Psychologically, the depressed person fails to shake off negative thoughts and feelings. Their negative internal working models are activated. George Brown and Tirril Harris found that depressive episodes in adulthood are often triggered by a failure to get emotional support, or by some situation that involves a rejection or a loss of self-esteem (Brown and Harris 1978). Depressed people easily feel that they are ineffective or unwanted. This leads to negative thoughts about the self – 'I'm an idiot. I'm no good. I'm not worthy of attention. I'm pathetic.' When it is not forthcoming, the need for positive feedback and attention from others feels shameful.

In their ground-breaking research of the 1970s, they pointed out that some people appear to be more vulnerable to current humiliations. They attempted to track down these vulnerable types and found that those who had lost a mother before the age of 11 were vulnerable, as were those whose attachments to others were generally insecure. They suggested that there was some missing element of self-esteem, which made it harder to believe that 'in the end, alternative sources of value will become available'. People vulnerable to depression had little ability to repair the tears in self-esteem caused by psychological injuries.

We might now describe this difficulty in recovering from psychological blows as a problem in self-regulation. Depressed people 'ruminate'. They cannot stop thinking painfully about their unmet emotional needs, yet they are unable to take smaller practical steps towards improving their situation. They struggle to avoid others' disapproval and rejection, yet feel helplessly disempowered and ineffective in winning the support they long for. They are in a self-regulatory bind, unable to give up their goals yet lacking the confidence to persist in achieving them (Carver and Scheier 1998).

Rupture and repair

Allan Schore has also drawn attention to this crucial dimension of the depressive experience. In a social context, hopelessness is the result of not being able to put things right. It

is not just having negative thoughts about oneself – a crucial element of depression is that it also involves the feeling that there is no way of redeeming the self, of recovering others' good opinion or love. Carys often gave up on people or situations, believing that there was nothing she could do to improve her situation. On one occasion, she had forgotten to tell the doctor she worked for that a patient needed an urgent visit. This was a serious oversight. It could have had bad consequences for the patient. Carys just knew that she was going to lose her job and she would never find one as convenient. The doctor, whom she admired and who had always been friendly to her, would be so furious with her he wouldn't speak to her any more. And who could blame him? She was incompetent and stupid. She let people down. She was so tortured by guilty feelings that she failed to turn up to work. She couldn't face it. She made her situation worse, forcing the doctor to sack her. It didn't occur to her that she could explain and apologise, or that he might understand how exhausted she had been that day because her daughter had woken her in the middle of the night having a miscarriage. She gave up on her working relationship without attempting to repair it, or at least restore some mutual respect and understanding even if she had to lose her job.

Schore calls this the 'disruption and repair' cycle. When stress and conflict between people occur, as it inevitably will in every relationship, it is crucial to learn that the positive relationship can be restored. This is at the heart of the attachment between parent and child and is the core of emotional security and self-confidence. It is a repair system that is set up in a child's early life and is established by the age of one year. The secure child learns that the parent figures will soothe and comfort him when he is distressed; they won't leave him to suffer for too long. But if the child learns instead that he cannot turn to mum or dad for comfort when he is distressed, because they ignore him or punish him even more, then he will be stuck in stressful feelings, with cortisol running high, unable to turn it off. That is the parent's job in early life as the child has no capacity to regulate himself.

The child who experiences stress which isn't calmed by his parents grows up like Carys. He doesn't expect to be able to manage those painful feelings of conflict with others. But this isn't a personality trait that he was born with. It is a problem of regulation, which is learnt. More recently, attention has turned to the way in which depressed people regulate their feelings. Judy Garber made a series of fascinating studies of depressed people and their regulatory strategies (Garber and Dodge 1991). It was found that they have a dysfunctional style of regulation, based on the more primitive mechanism of 'fight or flight'. They seem to lack the more complex regulatory strategies that are associated with prefrontal development. Instead of actively solving problems with other people, talking things through, confident that some resolution can be found, they tend either to withdraw from people or attack them aggressively.

Megan Gunnar and Andrea Dettling's research on children with high cortisol echoed this finding. They found that high cortisol children don't expect to be able to deal effectively with other people's negative feelings. Their teachers rate them as less socially competent than other children for the very same reason – they manage negative feelings and difficult situations either by withdrawing or with aggression (Dettling *et al.* 1999, 2000).

Garber and Dodge (1991) discovered that depressed children have different expectations of their mothers from non-depressed children. They don't expect their mothers to be able to regulate them better than they can themselves. They don't expect to be able to alter their negative mood. This may be part of the reason why depressed people so easily fall into global negatives such as 'I'm stupid' or 'I'm bad'. As children they have tried to account for their experience of negative events. But from a child's perspective there is no way of knowing that their regulatory partner could act differently, so they tend to blame themselves and their own inadequacies for their misery. This dilemma, known as the 'moral defence', was described in the 1940s by Scottish psychoanalyst Ronald Fairbairn who recognised that children were reluctant to admit that their parents were bad because it was safer for oneself to be bad

than a parent on whom you depend for survival (Fairbairn 1952).

There is evidence to show that depressed parents, in particular, do offer less good regulation to their children than other parents. Their lack of attentiveness to their children's states may result in a failure to pass on good regulatory strategies. Their children may lack confidence that feelings can be managed jointly in co-operation with other people. On the other hand, children who are not depressed (and who do not have depressed parents) are much more able to respond to negative events by taking some sort of action. They use active problem solving, and deliberate distraction. When things go wrong, they draw the conclusion that they need to try harder, or perhaps give up and try something else. They don't assume that they are stuck, or that it must be their fault.

The passivity and apathy of the depressed may have a biochemical dimension, but at a behavioural level it is also the result of internal working models that are formed early in life. By early childhood the die may well be cast – children of depressed mothers have a 29 per cent chance of developing an emotional disorder compared to 8 per cent of children with a medically ill mother (Hammen *et al.* 1990). These are children who don't expect support, who don't anticipate relief from distress as a result of contact with their parent, and who don't know how to regulate their negative feelings. Because they don't expect ruptures to be repaired, they don't turn to others. Because they have not been taught to focus on solving problems step by step, they cannot imagine any solution. They are truly stuck with negative feelings that they don't know how to disperse, other than by running away.

Unfortunately, depression is also cumulative. These kinds of thought patterns tend to get more easily evoked the more often the person feels hopeless. It has been found that the more often a person has a depressive episode, the more difficult it becomes to recover. Confidence that was not well established early in life may become progressively eroded as the individual fails to manage one situation after another. Brains that are emotionally underpowered by a lack

of neurotransmitters and a less developed prefrontal cortex find it hard to generate new solutions, to find new ways of managing and calming the overactive stress response.

Clearly it is much more effective to prevent this vicious cycle from gathering pace. If it were recognised that babyhood holds some of the keys to depression, it might seem more urgent to treat it at the earliest opportunity, providing a more supportive environment for early parenting, or by providing young children with the regulatory skills and emotional confidence that they lack.